

WHAT IS CLAIMED IS:

1. A method for resistance seam welding of a foil and at least one foil support of a fuel cell system, the method comprising:

pairing the at least one foil support with the foil;
disposing the foil and at least one foil support on a flat support element;
welding the at least one foil support and the foil in a gas-tight manner by resistance heating using a roller electrode and an electric power supply; and
moving the foil and the at least one foil support on the support element relative to the roller electrode during the welding.

2. The method as recited in claim 1, wherein the at least one foil support includes only one foil support, and wherein the disposing is performed so that the foil is in contact with the support element.

3. The method as recited in claim 1, wherein the at least one foil support includes two foil supports, wherein the pairing includes disposing the foil between the two foil supports, and wherein the disposing is performed so that one of the two foil supports is in contact with the support element.

4. The method as recited in claim 1, further comprising performing a heat treatment on the foil and the at least one foil support after the welding.

5. The method as recited in claim 4, wherein the heat treatment includes slowly heating the foil to a first temperature value during a first time period, keeping the foil at the first temperature value during a second time period and, decreasing the temperature of the foil to a second temperature value during a third time period.

6. The method as recited in claim 5, wherein the foil contains at least one of palladium and copper and a ratio of the first to the second time period to the third time period is essentially

5:2:1.

7. The method as recited in claim 6, wherein the first time period lasts 2.5 hours, the second time period lasts 1 hour, and the third time period lasts 0.5 hour.

8. The method as recited in claim 6m wherein the first temperature value is 425°C and the second temperature value is 70°C.

9. The method as recited in claim 1, further comprising annealing the foil and the at least one foil support after the welding.

10. The method as recited in claim 9, where the annealing is performed in a vacuum.

11. The method as recited in claim 9, wherein the annealing is performed under at least one of an inert gas and pure hydrogen.

12. A system for resistance seam welding of a foil and at least one foil support of a fuel cell system, comprising:

- a roller electrode;

- a counter-electrode forming a flat support element and being displaceable relative to the roller electrode, the foil and the at least one foil support being disposed between the roller electrode and the counter electrode such that the roller electrode is in rolling contact with the at least one foil support, a movement of the foil and the at least one foil support relative to the roller electrode being possible; and

- an electric power supply having terminals connected to the roller electrode and the counter-electrode.

13. The system as recited in claim 12, wherein the counter-electrode and the roller electrode include a copper-containing material.

14. The system as recited in claim 13, wherein the at least one foil support includes only one foil support and the counter-electrode includes a material having a high specific electrical resistance.

15. The system as recited in claim 14, wherein the material is an alloy containing tungsten and copper.

16. The system as recited in claim 14, further comprising a cooling device connected to at least one of the roller electrode and the counter-electrode.

17. The system as recited in claim 12, wherein the at least one foil support includes two foil supports and the foil is disposed between the two foil supports, and wherein the counter-electrode includes a material having a low specific electrical resistance.

18. The system as recited in claim 17, wherein the material is one of an alloy containing copper and beryllium and an alloy containing tungsten and copper.